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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/591,026	06/09/2000	Gerd Vandersteen	IMEC211.001A	2576

20995 7590 10/26/2004

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EXAMINER
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FERRIS III, FRED O

ART UNIT	PAPER NUMBER
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2128

DATE MAILED: 10/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/591,026

Applicant(s)

VANDERSTEEN ET AL.

Examiner

Fred Ferris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-17 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/17/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. *Claims 1-17 have been presented for examination based on applicant's amendment filed on 17 July 2004. Claims 1-17 are currently pending in this application. Claims 11-17 have now been allowed over the prior art of record. Claims 1-10 remain rejected by the examiner.*

### **Response to Arguments**

2. *Applicant's arguments filed on 17 July 2004 have been fully considered. Regarding applicant's response to objection to the drawings: The examiner withdraws the objection to the drawings in view of applicant's formal drawings submitted on 17 July 2004.*

*Regarding applicant's response to objection to the specification: The examiner withdraws the objection to the specification in view of applicant's amendment filed on 17 July 2004.*

*Regarding applicant's response to objection to the claims: The examiner withdraws the objection to the claims in view of applicant's amendment to the claims filed on 17 July 2004.*

*Regarding applicant's response to 35 USC 101 and 112(2) rejections: The examiner withdraws the previous 35 USC 101 and 112(2) rejections in view of applicant's amendment to the claims filed on 17 July 2004. However, while the examiner appreciates applicants attempt to correct issues relating to mixing of statutory classes, the amendment has now introduced new issues relating to lack of antecedent basis. (please see new 112(2) rejections below)*

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Regarding applicant's response to 35 USC 102(e)/103(a) rejections: The examiner concurs with applicant's arguments relating to claims 11-17 and therefore withdraws the 102/103 rejection of claims 11-17. (see allowable subject matter below) However, while applicant's arguments with respect to claims 1-10 have been fully considered, they are now moot in view of the new ground(s) of rejection against amended claims 1-10. The examiner also notes that applicant's amendment to independent claim 1 has sufficiently broadened to the scope of the claim. (please see new 103(a) rejection below)

### **Claim Rejections - 35 USC § 112**

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**3. Claims 2, 5, 7, 9 and 10 recite the limitations "said system" and/or "said subsystems". There is insufficient antecedent basis for these limitations in claims 2, 5, 7, 9, and 10.**

Specifically, applicant's amendment has made independent claim 1 a method claim and deleted wording relating to the "system being simulated comprising of **subsystems** and connections between said **subsystems**".

Therefore, the limitations "said system" and "said subsystems" in dependent claims 2, 5, 7, 9, and 10 now lack antecedent basis. While the examiner believes this to simply be an oversight, corrective action is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

***4. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,252,909 issued to Tzannes et al in view of U.S. Patent 5,369,404 issued to Galton.***

*Independent claim 1 is drawn to:*

*Digitally simulating signals comprising subsystems and connections:*

- *Representing signals by sum of two carriers*
- *Each modulated by a bandpass signal*
- *Bandpass signals have different bandwidth*

*Regarding independent claim 1: Tzannes discloses a multi-carrier, multi-rate communication system having multiple channels capable of different bandwidths. (Abstract, Summary of Invention, Figs. 1-5) Tzannes discloses the elements of the claimed limitations of the present invention as follows:*

- Representing signals by sum of two carriers: Tzannes discloses combining a first and second modulated carrier to form a sum signal. (Abstract, CL2-L41-45, Figs. 1-3)

- Each modulated by a bandpass signal: Tzannes discloses a modulator that includes a tree-structured array of filter (bandpass) banks. (CL2-L46, CL3-L36, CL4-L32-53, Fig. 2)

- Bandpass signals have different bandwidth: Tzannes discloses a modulator incorporating filter (bandpass) banks capable of modulating the carriers where each signal can have a different bandwidth. (Abstract, CL2-L44 : also see claim 1)

Tzannes does not explicitly teach simulating the represented signals.

Galton discloses the use of MATLAB Simulink to represent a simulated modulator capable of modulating a carrier signal. (Fig. 7) In particular, Galton specifically discloses that it is known in the art to use commercially available software tools such as MATLAB Simulink (or HP-ADS) to realize a simulated modulator capable of digitally simulating signals comprising the subsystems and connections of a communications system. (CL9-L41-47, Figs. 7-10)

Therefore, It would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the teachings of Tzannes relating to the summing of modulated carrier signals were carriers have different bandwidths, with the teachings of Galton relating to a simulated modulator capable of digitally simulating signals comprising the subsystems and connections of a communications system, to realize the claimed invention. An

*obvious motivation exists since this area of technology is highly competitive with many techniques for realizing multi-carrier and multi-rate communications systems available in the market place. (see Qin, Ottosson / Abstracts, for example) Accordingly, a skilled artisan would have made an effort to become aware of what capabilities had already been developed in the market place, and hence, would have knowingly modified the teachings of Tzannes with the teachings of Galton in order to reduce development time and cost.*

*Per dependent claim 2: Both Tzannes and Galton disclose electrical communications systems as noted above.*

*Per dependent claim 3: As noted above, Tzannes discloses a modulator incorporating filter (bandpass) banks capable of modulating the carriers where each signal can have a different bandwidth or for carriers with common frequencies. (Abstract, CL2-L44)*

*Per dependent claim 4: Tzannes discloses modulator filter (bandpass) banks that are substituted with smaller bands based on signal representation. (FL4-L25-29)*

*Per dependent claims 5-10: This group of claims merely claims limitations relating to constructing a computational graph (a known feature of MATLAB Simulink, see: Galton Figs. 8-10) and a subsystem representation using a computation node structure. Tzannes discloses a modulator tree-structured array of filter banks having M leaf nodes, each of the values related to the symbols forming an input to a corresponding one of the leaf nodes. (CL2-L45-53) The recited "rules" are undefined by the claim language and are therefore*

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*interpreted to be equivalent to the algorithmic method taught by Tzannes (CL5-L25-CL6-L21).*

**Allowable Subject Matter**

5. *Claims 11-17 have been allowed over prior art of record.*

**The following is an examiners statement of reasons allowance:**

*Regarding claims 11-16: Claims 11-16 use “means for” language and are given deference in view of *In re Donaldson* and interpreted in view of 35 U.S.C. § 112 paragraph 6. The “means for” language and the limitations related thereto of claims 11-16 are therefor interpreted within the scope of the enablement as provided within the relative embodiment provided in applicant’s specification. Specifically, applicant’s “means for” language recited in independent claim 11 is interpreted as specifically disclosed within the embodiment of the specification as follows:*

- means for entering a system representation: page 19, line 25 to page 20, line 10, page 22, line 10 to page 26, line 8, Figs. 6, 7, 24-26.*
- means for transforming representation into graph comprising computation nodes having scheduled rules of execution: page 26, line 10 to page 31, line 29, Figs. 24-26.*
- a scheduler for scheduling execution of computation rules: page 30, line 15 to page 31; line 28, Figs. 24-26.*



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- means for execution of computations rules in order determined by scheduler: page 6, line 21 to page 7, line 29, page 30, line 15 to page 31, line 28, Figs. 6, 7, 24-26.

Dependent claims 12-16 are allowable as being dependent from independent claim 11.

Regarding independent claim 17: Independent claim 17 claims the associated apparatus sections (elements) for the same limitations recited above. The terms defining these elements have therefore been interpreted as defined by the specification as follows:

- entering section: page 19, line 25 to page 20, line 10, page 22, line 10 to page 26, line 8, Figs. 6, 7, 24-26.
- transforming section: page 26, line 10 to page 31, line 29, Figs. 24-26.
- scheduler for execution: page 30, line 15 to page 31, line 28, Figs. 24-26.
- execution section: page 6, line 21 to page 7, line 29, page 30, line 15 to page 31, line 28, Figs. 6, 7, 24-26.

Claim 17 is deemed novel and non-obvious over the prior art of record since the specific arrangement of these elements as defined above is not explicitly disclosed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### **Conclusion**

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 6,606,588 issued to Schaumont et al teaches digital signal simulation.

"Equalisation in a Multi-carrier Code Division Multiple Access Multi-Rate System", L. Freiberg, IEEE 0-7803-3143-5, IEEE 1996, teaches multi-carrier simulation.

"Performance of a Multi-rate CDMA Packet Data System", R. Walton, IEEE 0-7803-4872-9/98, IEEE 1998, teaches multi-carrier simulation.

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*Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 703-305-9670 and whose normal working hours are 8:30am to 5:00pm Monday to Friday.*

*If attempts to reach the examiner are unsuccessful, the examiners supervisor, Jean Homere can be reached at 703-308-6647.*

*Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 703-305-3900.*

The Official Fax Numbers are:

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October 19, 2004

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